

Search History

STN

(HCAPLUS, INSPEC, JAPIO, USPATALL)
1/25/2006

=> d hi's

(FILE 'HOME' ENTERED AT 12:57:39 ON 25 JAN 2006)

FILE 'HCAPLUS, INSPEC, JAPIO, USPATFULL, USPAT2' ENTERED AT 12:57:59 ON 25 JAN 2006

L1 12103 S (LEC OR LIQUID(W) ENCAPSULATED(W) CZOCHRALSKI)
L2 1893 S (FIRST OR PRIMARY) (6A) (CRUCIBLE)
L3 1 S (SECOND?) (6A) (CUCIBLE)
L4 1504 S (SECOND?) (6A) (CRUCIBLE)
L5 251543 S (COMMUNICATION) (8A) (HOLE# OR VIA# OR OPEN?)
L6 31736 S (CONTROL? OR ALTER? OR MANIPULAT? OR VARY?) (8A) (HEATER#(8A)TE
L7 1845539 S (DIAMETER#)

=> s l1 and l2 and l4 and l5 and l6 and l7

L8 1 L1 AND L2 AND L4 AND L5 AND L6 AND L7

=> d l8 abs,bib

L8 ANSWER 1 OF 1 USPATFULL on STN
AB A method for producing a compound semiconductor single crystal by a liquid encapsulated Czochralski method, including containing a semiconductor raw material and an encapsulating material in a raw material melt-containing portion having a first crucible having a bottom and a cylindrical shape and a second crucible disposed within the first crucible and having a communication hole communicating with the first crucible in a bottom portion thereof; melting the raw material by heating the raw material melt-containing portion, and growing a crystal by making a seed crystal contact with a surface of the raw material melt in a state covered with the encapsulating material and by pulling up the seed crystal. A heater temperature is controlled so that a diameter of a growing crystal becomes approximately equal to an inner diameter of the second crucible, and the crystal is grown by maintaining a surface of the growing crystal in a state covered with the encapsulating material until termination of crystal growth.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2005:138090 USPATFULL
TI Production method for compound semiconductor single crystal
IN Asahi, Toshiaki, 17-35, Niizominami 3-chome, Toda-Shi, Saitama, JAPAN
Sato, Kenji, Toda-shi Saitama, JAPAN
Arakawa, Atsutoshi, Kitaibaraki-shi Ibaraki, JAPAN
PA Nikko Materials Co., Ltd., Tokyo, JAPAN, 105-8407 (non-U.S. corporation)
PI US 2005118739 A1 20050602
~~AI US 2003-502228 A1 20021217 (10)~~
WO 2002-JP13165 20021217
PRAI JP 2003-2002035551 20020213
JP 2003-2002208530 20020717
JP 2003-2002249963 20020829
DT Utility
FS APPLICATION
LREP BIRCH STEWART KOLASCH & BIRCH, PO BOX 747, FALLS CHURCH, VA, 22040-0747, US
CLMN Number of Claims: 12
ECL Exemplary Claim: 1
DRWN 1 Drawing Page(s)
LN.CNT 479
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=>

=> d 19' 1-10 abs, bib

L9 ANSWER 1 OF 10 USPATFULL on STN

AB A method for producing a compound semiconductor single crystal by a liquid encapsulated Czochralski method, including containing a semiconductor raw material and an encapsulating material in a raw material melt-containing portion having a first crucible having a bottom and a cylindrical shape and a second crucible disposed within the first crucible and having a communication hole communicating with the first crucible in a bottom portion thereof; melting the raw material by heating the raw material melt-containing portion; and growing a crystal by making a seed crystal contact with a surface of the raw material melt in a state covered with the encapsulating material and by pulling up the seed crystal. A heater temperature is controlled so that a diameter of a growing crystal becomes approximately equal to an inner diameter of the second crucible, and the crystal is grown by maintaining a surface of the growing crystal in a state covered with the encapsulating material until termination of crystal growth.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2005:138090 USPATFULL
TI Production method for compound semiconductor single crystal
IN Asahi, Toshiaki, 17-35, Niizominami 3-chome, Toda-Shi, Saitama, JAPAN
Sato, Kenji, Toda-shi Saitama, JAPAN
Arakawa, Atsutoshi, Kitaibaraki-shi Ibaraki, JAPAN
PA Nikko Materials Co., Ltd., Tokyo, JAPAN, 105-8407 (non-U.S. corporation)
PI US 2005118739 A1 20050602
AI US 2003-502228 A1 20021217 (10)
WO 2002-JP13165 20021217
PRAI JP 2003-2002035551 20020213
JP 2003-2002208530 20020717
JP 2003-2002249963 20020829
DT Utility
FS APPLICATION
LREP BIRCH STEWART KOLASCH & BIRCH, PO BOX 747, FALLS CHURCH, VA, 22040-0747, US
CLMN Number of Claims: 12
ECL Exemplary Claim: 1
DRWN 1 Drawing Page(s)
LN.CNT 479

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 2 OF 10 USPATFULL on STN

AB A large semiconductor crystal has a diameter of at least 6 inches and a low dislocation density of not more than $1 \times 10^{10} \text{ cm}^{-2}$. The crystal is preferably a single crystal of GaAs, or one of CdTe, InAs, GaSb, Si or Ge, and may have a positive boron concentration of not more than $1 \times 10^{16} \text{ cm}^{-3}$ and a carbon concentration of $0.5 \times 10^{15} \text{ cm}^{-3}$ to $1.5 \times 10^{15} \text{ cm}^{-3}$ with a very uniform concentration throughout the crystal. Such a crystal can form a very thin wafer with a low dislocation density. A special method and apparatus for producing such a crystal is also disclosed.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2003:286172 USPATFULL
TI Large size semiconductor crystal with low dislocation density
IN Kawase, Tomohiro, Itami-shi, JAPAN
Hashio, Katsushi, Itami-shi, JAPAN
Sawada, Shin-ichi, Itami-shi, JAPAN
Tatsumi, Masami, Itami-shi, JAPAN
PA Sumitomo Electric Industries, Ltd., Osaka, JAPAN (non-U.S. corporation)
PI US 2003200913 A1 20031030
US 6866714 B2 20050315
AI US 2003-430027 A1 20030505 (10)
RLI Division of Ser. No. US 2001-779097, filed on 7 Feb 2001, GRANTED, Pat. No. US 6572700 Continuation-in-part of Ser. No. US 1998-217349, filed on 21 Dec 1998, GRANTED, Pat. No. US 6254677

PRAI JP 1997-360090 19971226
JP 1998-72969 19980323
JP 1998-352557 19981211
DT Utility
FS APPLICATION
LREP FASSE PATENT ATTORNEYS, P.A., P.O. BOX 726, HAMPDEN, ME, 04444-0726
CLMN Number of Claims: 14
ECL Exemplary Claim: 1
DRWN 16 Drawing Page(s)
LN.CNT 921
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 3 OF 10 USPATFULL on STN
AB A large semiconductor crystal is produced by charging a raw material into a crucible in a reactor tube, sealing the reactor tube with a flange on an open end of the tube, pressurizing the interior of the tube to an elevated pressure with an inert gas, heating the tube with an externally arranged heater to melt the raw material to form a raw material melt in the crucible, and solidifying the raw material melt to grow the semiconductor crystal. A second raw material such as a group V element can be introduced as a vapor from a reservoir into the melt in the crucible to form a compound semiconductor material. The flange is sealed to the tube by an elastic seal member, of which the temperature is maintained below 400° C. throughout the process, to protect its elastic sealing properties.

CAS INDEXING IS AVAILABLE FOR THIS PATENT

AN 2003:211159 USPATFULL
TI Method for producing a semiconductor crystal
IN : Kawase, Tomohiro, Itami-shi, JAPAN
Hashio, Katsushi, Itami-shi, JAPAN
Sawada, Shin-ichi, Itami-shi, JAPAN
Tatsumi, Masami, Itami-shi, JAPAN
PA Sumitomo Electric Industries, Ltd., Osaka-shi, JAPAN (non-U.S. corporation)
PI US 2003145782 A1 20030807
US 6780244 B2 20040824
AI US 2003-376097 A1 20030226 (10)
RLI Division of Ser. No. US 2001-779097, filed on 7 Feb 2001, GRANTED, Pat. No. US 6572700 Continuation-in-part of Ser. No. US 1998-217349, filed on 21 Dec 1998, GRANTED, Pat. No. US 6254677
PRAI JP 1997-360090 19971226
JP 1998-72969 19980323
JP 1998-352557 19981211
DT Utility
FS APPLICATION
LREP FASSE PATENT ATTORNEYS, P.A., P.O. BOX 726, HAMPDEN, ME, 04444-0726
CLMN Number of Claims: 20
ECL Exemplary Claim: 1
DRWN 16 Drawing Page(s)
LN.CNT 971
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 4 OF 10 USPATFULL on STN
AB An apparatus and method of providing a large semiconductor crystal at a low cost are provided. The apparatus of producing a semiconductor crystal includes a reactor tube having an open end at least one end side, formed of any one material selected from the group consisting of silicon carbide, silicon nitride, aluminum nitride, and aluminum oxide, or of a composite material with any one material selected from the group consisting of silicon carbide, silicon nitride, aluminum nitride, boron nitride, aluminum oxide, magnesium oxide, mullite, and carbon as a base, and having an oxidation-proof or airtight film formed on the surface of the base, a kanthal heater arranged around the reactor tube in the atmosphere, a flange attached at the open end to seal the reactor tube, and a crucible mounted in the reactor tube to store material of a semiconductor crystal. The material stored in the crucible is heated and melted to form material melt. The material melt is solidified to grow a semiconductor crystal.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2001:113851 USPATFULL
TI Semiconductor crystal, and method and apparatus of production thereof
IN Kawase, Tomohiro, Itami-shi, Japan
Hashio, Katsushi, Itami-shi, Japan
Sawada, Shin-Ichi, Itami-shi, Japan
Tatsumi, Masami, Itami-shi, Japan
PI US 2001008115 A1 20010719
US 6572700 B2 20030603
AI US 2001-779097 A1 20010207 (9)
RLI Continuation-in-part of Ser. No. US 1998-217349, filed on 21 Dec 1998,
PENDING
PRAI JP 1997-360090 19971226
JP 1998-72969 19980323
JP 1998-352557 19981211
DT Utility
FS APPLICATION
LREP FASSE PATENT ATTORNEYS, P.A., P.O. BOX 726, HAMPDEN, ME, 04444-0726
CLMN Number of Claims: 29
ECL Exemplary Claim: 1
DRWN 16 Drawing Page(s)
LN.CNT 1018
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 5 OF 10 USPATFULL on STN

AB An apparatus for and method of producing a large semiconductor crystal at a low cost are provided. The apparatus for producing a semiconductor crystal includes a reactor (1) having an open end at both ends thereof, that is formed of any material selected from the group consisting of silicon carbide, silicon nitride, aluminum nitride, and aluminum oxide, or of a composite material including a base material selected from the group consisting of silicon carbide, silicon nitride, aluminum nitride, boron nitride, aluminum oxide, magnesium oxide, mullite, and carbon as a base, and including an oxidation-proof or airtight film formed on the surface of the base. The apparatus further includes a resistance heater (3) arranged around the reactor (1) in the atmosphere, a flange (9) attached at the open end to seal the reactor (1), and a crucible (2) mounted in the reactor (1) to store material of a semiconductor crystal. The material stored in the crucible (2) is heated and melted to form a material melt (60). The material melt is solidified to grow a semiconductor crystal (50).

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2001:102188 USPATFULL
TI Semiconductor crystal, and method and apparatus of production thereof
IN Hashio, Katsushi, Itami, Japan
Sawada, Shin-ichi, Itami, Japan
Tatsumi, Masami, Itami, Japan
PA Sumitomo Electric Industries, Ltd., Osaka, Japan (non-U.S. corporation)
PI US 6254677 B1 20010703
AI US 1998-217349 19981221 (9)
PRAI JP 1997-360090 19971226
JP 1998-72969 19980323
JP 1998-352557 19981211
DT Utility
FS GRANTED
EXNAM Primary Examiner: Utech, Benjamin L.; Assistant Examiner: Deo, DuyVu
LREP Fasse, W. F., Fasse, W. G.
CLMN Number of Claims: 5
ECL Exemplary Claim: 1
DRWN 7 Drawing Figure(s); 7 Drawing Page(s)
LN.CNT 919

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 6 OF 10 USPATFULL on STN

AB A method and an apparatus for pulling a compound single crystal from a raw material molten solution is constructed to cause the solution to flow into a second crucible provided in a

first crucible containing the raw material molten solution which is continuously synthesized from a plurality of raw materials, through a communicating hole formed in the bottom portion of the second crucible. The single crystal is pulled while the raw material molten solution is continuously synthesized from the plurality of raw materials, whereby it is possible to pull a long single compound crystal through a single pulling step from the raw material molten solution which is contained in the second crucible. An excellent state of a solid-liquid interface is maintained to obtain a quality single crystal.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 94:17636 USPATFULL
TI Method of and apparatus for preparing single crystal
IN Matsumoto, Kazuhisa, Hyogo, Japan
Tatsumi, Masami, Osaka, Japan
Kawase, Tomohiro, Osaka, Japan
PA Sumitomo Electric Industries, Ltd., Osaka, Japan (non-U.S. corporation)
PI US 5290395 19940301
WO 9201826 19920206
AI US 1992-838776 19920317 (7)
WO 1991-JP987 19910724
19920317 PCT 371 date
19920317 PCT 102(e) date
PRAI JP 1990-198133 19900726
JP 1990-260708 19900928
JP 1990-281032 19901018
DT Utility
FS Granted
EXNAM Primary Examiner: Chaudhuri, Olik; Assistant Examiner: Garrett, Felisa
LREP Fasse, W. G.
CLMN Number of Claims: 20
ECL Exemplary Claim: 1
DRWN 5 Drawing Figure(s); 5 Drawing Page(s)
LN.CNT 798

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 7 OF 10 USPATFULL on STN
AB An apparatus and method employing an interface heater segment for control of a shape of a peripheral edge region of a solidification interface in a Czochralski crystal pulling process are provided wherein an interface heater segment, independently controllable from a primary heater, is provided at the level of the solidification interface around the periphery of the crucible, the interface heater segment being selectively controlled to influence the shape of the solidification interface at the peripheral edge region thereof, in order to eliminate problems experienced with edge downturn at the peripheral edge region of the interface.

AN 92:65779 USPATFULL
TI Apparatus and method employing interface heater segment for control of solidification interface shape in a crystal growth process
IN Azad, Farzin H., Clifton Park, NY, United States
PA General Electric Company, Schenectady, NY, United States (U.S. corporation)
PI US 5137699 19920811
AI US 1990-628036 19901217 (7)
DT Utility
FS Granted
EXNAM Primary Examiner: Kunemund, Robert; Assistant Examiner: Garrett, Felisa
LREP Glaubensklee, Marilyn, Davis, Jr., James C., Webb, II, Paul R.
CLMN Number of Claims: 16
ECL Exemplary Claim: 1
DRWN 2 Drawing Figure(s); 2 Drawing Page(s)
LN.CNT 526

L9 ANSWER 8 OF 10 USPAT2 on STN
AB A large semiconductor crystal has a diameter of at least 6 inches and a low dislocation density of not more than $1 \times 10^{10} \text{ cm}^{-2}$. The

crystal is preferably a single crystal of GaAs, or one of CdTe, InAs, GaSb, Si or Ge, and may have a positive boron concentration of not more than $1 \times 10^{16} \text{ cm}^{-3}$ and a carbon concentration of $0.5 \times 10^{15} \text{ cm}^{-3}$ to $1.5 \times 10^{15} \text{ cm}^{-3}$ with a uniform concentration throughout the crystal. Such a crystal can form a very thin wafer with a low dislocation density. A special method and apparatus for producing such a crystal is also disclosed.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2003:286172 USPAT2
TI Large size semiconductor crystal with low dislocation density
IN Kawase, Tomohiro, Itami, JAPAN
Hashio, Katsushi, Itami, JAPAN
Sawada, Shin-ichi, Itami, JAPAN
Tatsumi, Masami, Itami, JAPAN
PA Sumitomo Electric Industries, Ltd., Osaka, JAPAN (non-U.S. corporation)
PI US 6866714 B2 20050315
AI US 2003-430027 20030505 (10)
RLI Division of Ser. No. US 2001-779097, filed on 7 Feb 2001, now patented, Pat. No. US 6572700, issued on 6 Jun 2003 Continuation-in-part of Ser. No. US 1998-217349, filed on 21 Dec 1998, now patented, Pat. No. US 6254677, issued on 3 Jul 2001
PRAI JP 1997-360090 19971226
JP 1998-72969 19980323
JP 1998-352557 19981211
DT Utility
FS GRANTED
EXNAM Primary Examiner: Deo, Duy-Vu N.
LREP Fasse, W. F., Fasse, W. G.
CLMN Number of Claims: 14
ECL Exemplary Claim: 1
DRWN 16 Drawing Figure(s); 16 Drawing Page(s)
LN.CNT 923
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 9 OF 10 USPAT2 on STN
AB A large semiconductor crystal is produced by charging a raw material into a crucible in a reactor tube, sealing the reactor tube with a flange on an open end of the tube, pressurizing the interior of the tube to an elevated pressure with an inert gas, heating the tube with an externally arranged heater to melt the raw material to form a raw material melt in the crucible, and solidifying the raw material melt to grow the semiconductor crystal. A second raw material such as a group V element can be introduced as a vapor from a reservoir into the melt in the crucible to form a compound semiconductor material. The flange is sealed to the tube by an elastic seal member, of which the temperature is maintained below 400°C . throughout the process, to protect its elastic sealing properties.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2003:211159 USPAT2
TI Method for producing a semiconductor crystal
IN Kawase, Tomohiro, Itami, JAPAN
Hashio, Katsushi, Itami, JAPAN
Sawada, Shin-ichi, Itami, JAPAN
Tatsumi, Masami, Itami, JAPAN
PA Sumitomo Electric Industries, Ltd., Osaka, JAPAN (non-U.S. corporation)
PI US 6780244 B2 20040824
AI US 2003-376097 20030226 (10)
RLI Division of Ser. No. US 2001-779097, filed on 7 Feb 2001, now patented, Pat. No. US 6572700 Continuation-in-part of Ser. No. US 1998-217349, filed on 21 Dec 1998, now patented, Pat. No. US 6254677, issued on 3 Jul 2001
PRAI JP 1997-360090 19971226
JP 1998-72969 19980323
JP 1998-352557 19981211
DT Utility
FS GRANTED
EXNAM Primary Examiner: Deo, Duy-Vu

LREP Fasse, W. F., Fasse, W. G.
CLMN Number of Claims: 20
ECL Exemplary Claim: 1
DRWN 16 Drawing Figure(s); 16 Drawing Page(s)
LN.CNT 973
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L9 ANSWER 10 OF 10 USPAT2 on STN

AB An apparatus and method of providing a large semiconductor crystal at a low cost are provided. The apparatus of producing a semiconductor crystal includes a reactor tube having an open end at least one end side, formed of any one material selected from the group consisting of silicon carbide, silicon nitride, aluminum nitride, and aluminum oxide, or of a composite material with any one material selected from the group consisting of silicon carbide, silicon nitride, aluminum nitride, boron nitride, aluminum oxide, magnesium oxide, mullite, and carbon as a base, and having an oxidation-proof or airtight film formed on the surface of the base, a kanthal heater arranged around the reactor tube in the atmosphere, a flange attached at the open end to seal the reactor tube, and a crucible mounted in the reactor tube to store material of a semiconductor crystal. The material stored in the crucible is heated and melted to form material melt. The material melt is solidified to grow a semiconductor crystal.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2001:113851 USPAT2
TI Semiconductor crystal, and method and apparatus of production thereof
IN Kawase, Tomohiro, Itami, JAPAN
Hashio, Katsushi, Itami, JAPAN
Sawada, Shin-ichi, Itami, JAPAN
Tatsumi, Masami, Itami, JAPAN
PA Sumitomo Electric Industries, Ltd., Osaka, JAPAN (non-U.S. corporation)
PI US 6572700 B2 20030603
AI US 2001-779097 20010207 (9)
RLI Continuation-in-part of Ser. No. US 1998-217349, filed on 21 Dec 1998
PRAI JP 1997-360090 19971226
JP 1998-72969 19980323
JP 1998-352557 19981211

DT Utility
FS GRANTED

EXNAM Primary Examiner: Kunemund, Robert; Assistant Examiner: Deo, Duy-Vu

LREP Fasse, W. F., Fasse, W. G.
CLMN Number of Claims: 35
ECL Exemplary Claim: 1
DRWN 16 Drawing Figure(s); 16 Drawing Page(s)
LN.CNT 1094
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

=> d his

(FILE 'HOME' ENTERED AT 12:57:39 ON 25 JAN 2006)

FILE 'HCAPLUS, INSPEC, JAPIO, USPATFULL, USPAT2' ENTERED AT 12:57:59 ON 25 JAN 2006

L1 12103 S (LEC OR LIQUID(W) ENCAPSULATED(W) CZOCHRALSKI)
L2 1893 S (FIRST OR PRIMARY) (6A) (CRUCIBLE)
L3 1 S (SECOND?) (6A) (CUCIBLE)
L4 1504 S (SECOND?) (6A) (CRUCIBLE)
L5 251543 S (COMMUNICATION) (8A) (HOLE# OR VIA# OR OPEN?)
L6 31736 S (CONTROL? OR ALTER? OR MANIPULAT? OR VARY?) (8A) (HEATER#(8A)TE
L7 1845539 S (DIAMETER#)
L8 1 S L1 AND L2 AND L4 AND L5 AND L6 AND L7
L9 10 S L1 AND L2 AND L4 AND L6
L10 3 S L1 AND L2 AND L5 AND L6

=>

=> d his

(FILE 'HOME' ENTERED AT 12:57:39 ON 25 JAN 2006)

FILE 'HCAPLUS, INSPEC, JAPIO, USPATFULL, USPAT2' ENTERED AT 12:57:59 ON
25 JAN 2006

L1 12103 S (LEC OR LIQUID(W) ENCAPSULATED(W) CZOCHRALSKI)
L2 1893 S (FIRST OR PRIMARY) (6A) (CRUCIBLE)
L3 1 S (SECOND?) (6A) (CUCIBLE)
L4 1504 S (SECOND?) (6A) (CRUCIBLE)
L5 251543 S (COMMUNICATION) (8A) (HOLE# OR VIA# OR OPEN?)
L6 31736 S (CONTROL? OR ALTER? OR MANIPULAT? OR VARY?) (8A) (HEATER#(8A)TE
L7 1845539 S (DIAMETER#)
L8 1 S L1 AND L2 AND L4 AND L5 AND L6 AND L7
L9 10 S L1 AND L2 AND L4 AND L6
L10 3 S L1 AND L2 AND L5 AND L6

=> d l10 1-3 abs,bib

L10 ANSWER 1 OF 3 USPATFULL on STN

AB A method for producing a compound semiconductor single crystal by a
liquid encapsulated Czochralski method,
including containing a semiconductor raw material and an encapsulating
material in a raw material melt-containing portion having a
first crucible having a bottom and a cylindrical shape
and a second crucible disposed within the first
crucible and having a communication hole
communicating with the first crucible in a bottom
portion thereof; melting the raw material by heating the raw material
melt-containing portion; and growing a crystal by making a seed crystal
contact with a surface of the raw material melt in a state covered with
the encapsulating material and by pulling up the seed crystal. A
heater temperature is controlled so that a
diameter of a growing crystal becomes approximately equal to an inner
diameter of the second crucible, and the crystal is grown by maintaining
a surface of the growing crystal in a state covered with the
encapsulating material until termination of crystal growth.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2005:138090 USPATFULL
TI Production method for compound semiconductor single crystal
IN Asahi, Toshiaki, 17-35, Niizominami 3-chome, Toda-Shi, Saitama, JAPAN
Sato, Kenji, Toda-shi Saitama, JAPAN
Arakawa, Atsutoshi, Kitaibaraki-shi Ibaraki, JAPAN
PA Nikko Materials Co., Ltd., Tokyo, JAPAN, 105-8407 (non-U.S. corporation)
PI US 2005118739 A1 20050602
AI US 2003-502228 A1 20021217 (10)
WO 2002-JPI3165 20021217
PRAI JP 2003-2002035551 20020213
JP 2003-2002208530 20020717
JP 2003-2002249963 20020829
DT Utility
FS APPLICATION
LREP BIRCH STEWART KOLASCH & BIRCH, PO BOX 747, FALLS CHURCH, VA, 22040-0747,
US
CLMN Number of Claims: 12
ECL Exemplary Claim: 1
DRWN 1 Drawing Page(s)
LN.CNT 479
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 2 OF 3 USPATFULL on STN

AB A Czochralski method using radiation intercepting members (1, 9) is used
for manufacturing a single crystal such as compound semiconductors with
a high production yield using a material having a low thermal
conductivity or with a small temperature gradient in the pulling
direction. In this method, a coracle (6) having an opening is provided
in a melt contained in a crucible (3). A first

member (1) is positioned on the coracle (6) to intercept heat radiation from the melt. A second member (9) supported by a crystal pulling shaft (8) is positioned on the first member (1) to cover an opening formed at the center of the first member (1). Seeding is performed while heat loss is limited by intercepting the radiation with the first and the second members. After the seeding, a shoulder portion of a single crystal is formed while heat loss is still limited while intercepting the radiation with the members (1, 9). A cylindrical body of the single crystal is pulled by the shaft (8) which also lifts the members (1, 9).

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 95:59413 USPATFULL
TI Czochralski method using a member for intercepting radiation from a raw material molten solution
IN Tatsumi, Masami, Hyogo, Japan
Sawada, Shin-ichi, Hyogo, Japan
PA Sumitomo Electric Industries, Ltd., Osaka, Japan (non-U.S. corporation)
PI US 5429067 19950704
AI US 1994-181772 19940114 (8)
RLI Division of Ser. No. US 1992-865040, filed on 31 Mar 1992, now patented, Pat. No. US 5292487
PRAI JP 1991-83770 19910416
JP 1991-210786 19910822
DT Utility
FS Granted
EXNAM Primary Examiner: Breneman, R. Bruce; Assistant Examiner: Garrett, Felisa
LREP Fasse, W. G., Fasse, W. F.
CLMN Number of Claims: 18
ECL Exemplary Claim: 1
DRWN 33 Drawing Figure(s); 19 Drawing Page(s)
LN.CNT 1164
CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L10 ANSWER 3 OF 3 USPATFULL on STN

AB A Czochralski method using radiation intercepting members (1, 9) is used for manufacturing a single crystal such as compound semiconductors with a high production yield using a material having a low thermal conductivity or with a small temperature gradient in the pulling direction. In this method, a coracle (6) having an opening is provided in a melt contained in a **crucible** (3). A **first** member (1) is positioned on the coracle (6) to intercept heat radiation from the melt. A second member (9) supported by a crystal pulling shaft (8) is positioned on the first member (1) to cover an opening formed at the center of the first member (1). Seeding is performed while heat loss is limited by intercepting the radiation with the first and the second members. After the seeding, a shoulder portion of a single crystal is formed while heat loss is still limited while intercepting the radiation with the members (1, 9). A cylindrical body of the single crystal is pulled by the shaft (8) which also lifts the members (1, 9).

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 94:19927 USPATFULL
TI Czochralski method using a member for intercepting radiation from raw material molten solution and apparatus therefor
IN Tatsumi, Masami, Hyogo, Japan
Sawada, Shin-ichi, Hyogo, Japan
PA Sumitomo Electric Industries, Ltd., Osaka, Japan (non-U.S. corporation)
PI US 5292487 19940308
AI US 1992-865040 19920331 (7)
PRAI JP 1991-83770 19910416
JP 1991-210786 19910822
DT Utility
FS Granted
EXNAM Primary Examiner: Chaudhuri, Olik; Assistant Examiner: Garrett, Felisa
LREP Fasse, W. G., Fasse, W. F.
CLMN Number of Claims: 14
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